

## Perpetually Laborious: Computing Electric Power Transmission Before The Electronic Computer

ARISTOTLE TYMPAS

### INTRODUCTION

Placing Thomas Edison at the beginning of a history on electric power transmission hardly needs justification. Thomas Edison's abundant supply of pictures of himself as an inventive genius – and America's pressing demand for a myth of an ingenious inventor – combined to bestow a "Eureka" moment upon Edison's pioneering Pearl Street (New York) Station electric lighting network. But the history of the laborious computations that took place at Menlo Park and the division-of-computing labor of which Edison took advantage suggests a different view of inventive genius. The story of the computational pyramid formed by the labors of Francis R. Upton, Charles L. Clarke, and Samuel D. Mott (1879–1880) can be reconstructed from the existing literature.<sup>1</sup> In his reminiscences from Menlo Park, Edison's employee, Francis Jehl, detailed how Edison thought of constructing a miniaturized network to be used as a computer of the actual network. Knowing that constructing, maintaining, and using the miniature network required a considerable amount of skilled labor, Edison decided to hire an employee for it, Dr Herman Claudius. Edison enthusiastically welcomed Claudius to perform a type of computing work "requiring nerve and super abundance of patience and knowledge". Jehl remembered that the labor of constructing a miniature network of conductors, "all in proportion, to show Mr Edison what he would have to install in New York City in connection with the Pearl Street Station" was "gigantic".<sup>2</sup> Following the pattern of the Pearl Street Station electric lighting network, several similar networks were built in the early 1880s. In response, Edison's labor pyramid was enlarged by giving Claudius an assistant, Hermann Lemp, who performed the monotonous task of constructing the new miniature networks, which Edison needed for

1. See Robert D. Friedel and Paul Israel, *Edison's Electric Light: Biography of an Invention* (New Brunswick, NJ, 1986), pp. 120 and 124. See also, Paul Israel, *Edison: A Life of Invention* (New York, 1998), p. 179, Friedel and Israel, *Edison's Electric Light: Biography of an Invention*, pp. 36 and 148, and Francis Jehl, *Menlo Park Reminiscences* (Dearborn, MI, 1939), pp. 729–731.

2. See Jehl, *Menlo Park Reminiscences*, pp. 545–546.